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**Slot machine and playing method thereof**

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(71) Applicant(s)  
**Aruze Corp.**

(72) Inventor(s)  
**Kato, Yoichi**

(74) Agent / Attorney  
**Davies Collison Cave, 1 Nicholson Street, Melbourne, VIC, 3000**

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ABSTRACT OF THE DISCLOSURE

When symbols are arranged on a display, an object is displayed in order to notify the symbols that can be linked based on a relationship among an in-marker, an out-marker, and a direction, and further, a special symbol that can provide a special award independent of the number of links is set. When a start point and an end point set at prescribed positions in a symbol matrix can be linked based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols and the set special symbol.

FIG. 15

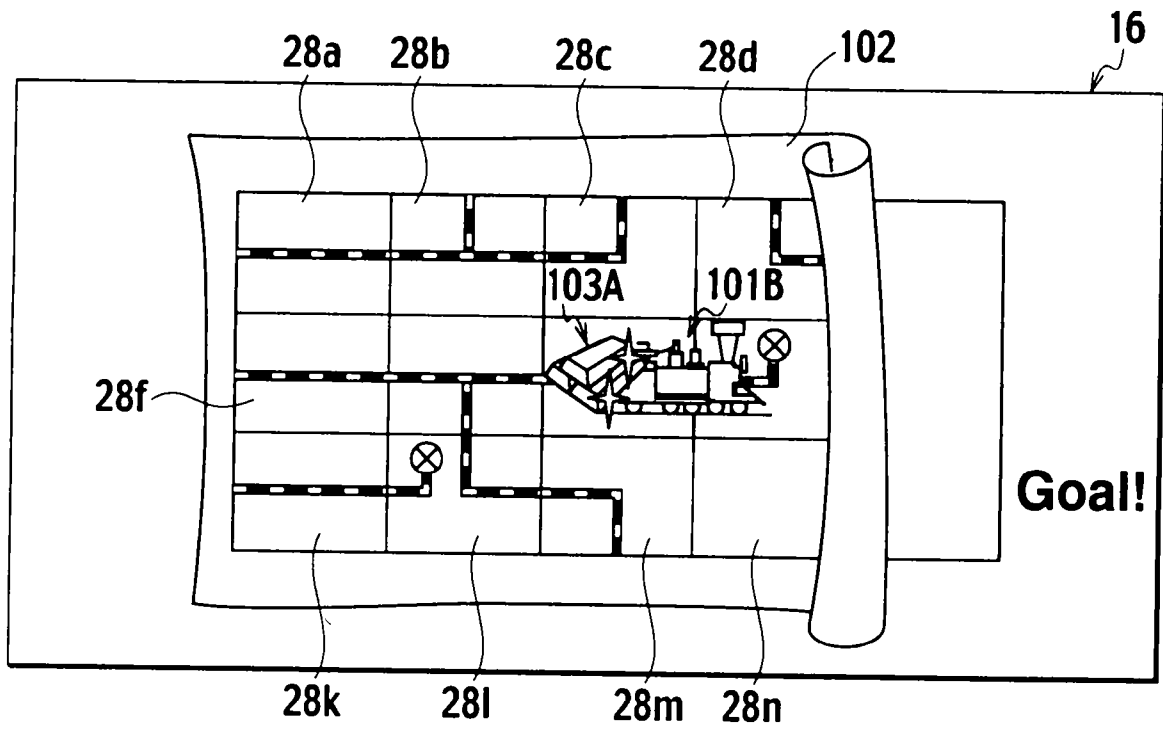
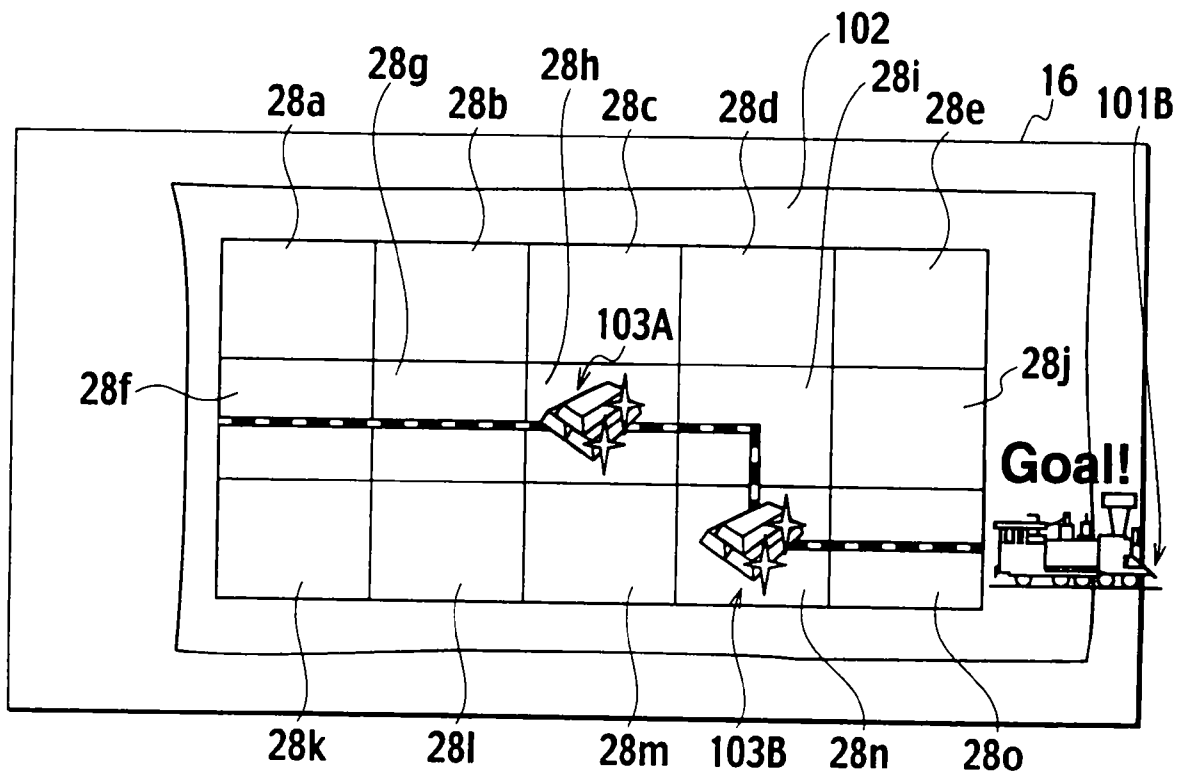


FIG. 16



**ORIGINAL COMPLETE SPECIFICATION  
STANDARD PATENT**

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Invention Title

Slot machine and playing method thereof

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

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#### CROSS REFERENCE TO RELATED APPLICATION

This application is based upon and claims the benefit of priority from Japanese Patent Application No. 2006-224142 filed on Aug. 21, 2006, the entire contents of which are incorporated herein by reference.

#### BACKGROUND OF THE INVENTION

##### 1. Field of the Invention

The present invention relates to a slot machine to play a game using a game medium, such as coin and bill, and a playing method thereof.

##### 2. Description of the Related Art

According to a conventional slot machine disclosed in United States Patent No. 6,960,133 or United States Patent No. 6,012,983, when a player inserts a game medium, such as medal, coin, bill, etc., into an insertion slot of a slot machine and presses a spin  
20 button, a plurality of symbols displayed on a display part provided on the front of the case is scrolled and then, each symbol automatically stops. In such an action, the processing to determine stop symbols has been performed when the spin button is pressed. When a transition to a bonus game, such as mystery  
25 bonus, second game, etc., is won due to the processing to determine stop symbols, the game transits from the base game to the bonus game and the bonus game is executed. Then, the slot machine is

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set so as to make a payout in accordance with a winning state that occurs as the game progresses.

Conventionally, an activated line (also referred to as a payline) to determine a combination of stop symbols is in general a straight line on a plurality of mechanical reels or video reels displayed on a liquid crystal display device. Recently, however, in addition to such a straight activated line, a slot machine appears that has taken into consideration a variety of activated lines as shown below. United States Patent No. 6,093,102 and United States Patent No. 6,960,133 have disclosed a slot machine that also includes activated lines other than the straight line.

In the above-mentioned slot machine, when a certain symbol stops on the activated line set on the matrix display part consisting of a plurality of columns and rows, a payout is made. As a result, the above-mentioned slot machine has the same display style as that of a slot machine having the previous straight activated line in that a combination of symbols accompanied by payout is formed on a prescribed line.

20 SUMMARY OF THE INVENTION

An object of the present invention is to provide a slot machine and a playing method thereof capable of providing a player with a sense of high expectation by giving novel entertainment property to the conditions to provide an award.

25 A first aspect of the present invention is a slot machine, comprising: a display on which display areas are formed in a matrix form, the display areas scrolling symbol columns in which a

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plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and a controller operable to: after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix, (a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and (b) stop the scroll state to display the determined symbols; and when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, (c) provide an award in accordance with the number of the linked symbols.

According to the above-mentioned slot machine, when the symbols are arranged on the display by the controller and if the start point and the end point set at the prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols.

A second aspect of the present invention is a slot machine, comprising: a display on which display areas are formed in a matrix form, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction

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are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and a controller operable to: after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix, (a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and (b) stop the scroll state to display the determined symbols; (c) display an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction; and when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, (d) provide an award in accordance with the number of the linked symbols.

20 According to the above-mentioned slot machine, when the symbols are arranged on the display by the controller and if the start point and the end point set at the prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols, and further, an object is displayed at the same time in order to notify the symbols that can be linked based on the relationship among the in-marker, 25 the out-marker, and the direction.

A third aspect of the present invention is a slot machine, comprising: a display on which display areas are formed in a matrix



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form, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and a controller operable to: after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix, (a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and (b) stop the scroll state to display the determined symbols; (c) set a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix; (d) display an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction; and when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, (e) provide an award in accordance with the number of links of the linked symbols.

25

According to the above-mentioned slot machine, when the symbols are arranged on the display by the controller, an object is displayed in order to notify the symbols that can be linked based on the relationship among the in-marker, the out-marker, and the direction and further, a special symbol that can provide a special award independent of the number of links is set. Then,

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if the start point and the end point set at the prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols and the special symbol.

A fourth aspect of the present invention is a playing method of a slot machine, comprising: an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from among the plurality of symbols, and stopping the scroll state to display the determined symbols to rearrange them as a new symbol matrix; and an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set at  
20 prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

25 According to the above-mentioned playing method of a slot machine, when the symbols are arranged on the display and if the start point and the end point set at the prescribed positions in

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the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols.

A fifth aspect of the present invention is a playing method of a slot machine, comprising: an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from among the plurality of symbols, and stopping the scroll state to display the determined symbols in order to rearrange them as a new symbol matrix; a step of displaying an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction: and an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

According to the above-mentioned playing method of a slot machine, when the symbols are arranged on the display and if the start point and the end point set at the prescribed positions in

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the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols, and at the same time, an object is displayed in order to notify the symbols that can be linked based on the relationship among the in-marker, the out-marker, and the direction.

A sixth aspect of the present invention is a playing method of a slot machine, comprising: an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from among the plurality of symbols, and stopping the scroll state to display the determined symbols in order to rearrange them as a new symbol matrix; a step of setting a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix; a step of displaying an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction: and an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the

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directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

According to the above-mentioned playing method of a slot machine, when the symbols are arranged on the display in the arrangement step, an object is displayed in order to notify the symbols that can be linked based on the relationship among the in-marker, the out-marker, and the direction and further, a special symbol that can provide a special award independent of the number of links is set. Then, if the start point and the end point set at the prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, an award is provided in accordance with the number of links of the linked symbols and the special symbol.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a flow chart showing a playing method of a slot machine according to an embodiment of the present invention.

Fig. 2 is a perspective view showing an outside appearance of a slot machine according to an embodiment of the present invention.

Fig. 3 is a diagram showing symbols displayed in respective display areas and code numbers of the respective symbols of a slot machine according to an embodiment of the present invention.

Fig. 4 is a diagram of a payout table showing a relationship between the number of linked symbols and its payout credits in an embodiment of the present invention.

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Fig. 5 is a diagram of an odds table showing a relationship between the number of high-odds symbols and odds in an embodiment of the present invention.

Fig. 6 is a block diagram showing a control circuit of a slot machine according to an embodiment of the present invention.

Fig. 7 is a flow chart showing a procedure of authentication read processing of a game program and a game system program by a motherboard and a gaming board of a slot machine according to an embodiment of the present invention.

Fig. 8 is a flow chart showing a procedure of a basic game executed in a slot machine according to an embodiment of the present invention.

Fig. 9 is a flow chart showing a procedure of stop symbol determination processing executed in a slot machine according to an embodiment of the present invention.

Fig. 10 is a flow chart showing a procedure of scroll processing of symbols executed in a slot machine according to an embodiment of the present invention.

20 Fig. 11 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

Fig. 12 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

25 Fig. 13 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

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Fig. 14 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

Fig. 15 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

Fig. 16 is an explanatory diagram showing a display example when a base game is executed in a slot machine according to an embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE EMBODIMENTS

A slot machine shown as an embodiment of the present invention will be described below in detail using drawings.

Fig. 1 is a flow chart schematically showing a playing method of a slot machine according to an embodiment of the present invention.

In a slot machine according to an embodiment of the present invention, when power is turned on and the slot machine is activated, first, authentication processing is performed (step S100). In the authentication processing, initial checking processing is performed in the pre-stage before a unit game is started, such as to check whether or not programs to activate the system operate normally, to check whether or not falsification of the program has been carried out, etc.

Next, a base game is executed (step S200). In the base game, when a spin button 23 is pressed in a state in which a desired number of credits has been bet by inserting a coin into a coin

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receiving slot 21 etc., scroll of a symbol column is started in each of display areas (28a to 28o) of a liquid crystal display 17 provided on the front of a cabinet 11. After that, a unit game is executed, in which the scroll stops and symbols are stopped (rearranged) in each of the display areas 28 (28a to 28o) with 5×3 squares, 15 squares in total.

In each unit game, processing to determine symbols to be stopped in each of the display areas (28a to 28o) from among the plurality of symbols is performed and arrangement control of stopping the determined symbols is carried out. In the present embodiment, since an in-marker (entrance), an out-marker(s) (exit), and a direction(s) are specified for a symbol, whether or not symbols can be linked depends on neighboring symbols stopped and displayed.

After the base game is executed, symbol columns arranged on the display are scrolled in one direction and rearranged as a new symbol matrix, whether or not a payout (award) results is determined (step S300). When a start point and an end point set at prescribed positions in the symbol matrix are linked based on the relationship among the in-markers, the out-markers, and the directions in neighboring symbols, payout (award) processing is performed in accordance with the number of links of the linked symbols (step S400).

In the present embodiment, a condition whether or not a payout (award) to a player results when symbols are stopped and displayed is characterized in that it is not determined based on whether or not a specific combination is formed on the conventional



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"activated line", but is formed when the start point and the end point set at the prescribed positions in the symbol matrix are linked based on the relationship among the in-markers, the out-markers, and the directions in neighboring symbols.

In the present embodiment, in the symbol matrix having five longitudinal squares  $\times$  three transverse squares (hereinafter, referred to as a  $5 \times 3$  squares), that is, a total of 15 squares, when symbols are rearranged and if a square (display area) as the start point through a square as the end point set in the symbol matrix are linked, a payout (award) is determined in accordance with the number of linked squares. In addition, a special symbol is set under the linked line by a single symbol independent of the number of linked symbols. When the special symbol (a gold ingot, in the present embodiment) is displayed, in addition to a payout due to the number of linked squares, a special payout (award) due to the special symbol is given. Then, an effect image in which an object (referred to as a piece object) in order to notify the player of the linked line moves is displayed. In the present embodiment, a case is described, in which the line is a  
20 "railroad" and a piece object is a "locomotive". The details of the base game will be described later.

In the present embodiment, an example is described, in which a symbol column is scrolled and stopped and displayed in each of the total of the 15 display areas 28 (28a to 28o) with  $5 \times 3$  squares,  
25 however, the present invention is not limited to the display areas 28 with  $5 \times 3$  squares.

Next, a configuration of a slot machine 10 according to an

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embodiment of the present invention will be described with reference to a perspective view shown in Fig. 2. The slot machine 10 is installed in a gaming facility.

In the slot machine 10, coins, bills, and electronic value information equivalent thereto are used as a game medium for executing a unit game. However, in the present embodiment, the game medium is not limited to those described above. For example, medals, tokens, electronic money, and tickets can be introduced. As a game medium to be paid out (awarded), coins, bills, and electronic value information equivalent thereto are also included. As a ticket described above, a bar code ticket etc., to be described later, can be introduced, for example, however, this is not limited.

As shown in Fig. 2, the slot machine 10 includes the cabinet 11, a top box installed on the upper side of the cabinet 11, and a main door 13 provided on the front of the cabinet 11.

20 Within the cabinet 11, the liquid crystal display 17 for scrolling symbols in a matrix with five transverse squares  $\times$  three longitudinal squares (referred simply to as  $5 \times 3$  squares in some cases) is provided, and the liquid crystal display 17 includes the display areas 28 (28a to 28o) for displaying symbols in the  $5 \times 3$  squares. In other words, when the base game is executed, the symbol column is scrolled in each of the display areas 28 (28a to 28o) with  $5 \times 3$  squares and a player can visually recognize the symbols being scrolled.

25

In the present embodiment, an example of the display areas 28 (28a to 28o) with  $5 \times 3$  squares of the liquid crystal display

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17 is described as a display, however, the display areas 28 are not limited to the 5x3 squares.

In front of the liquid crystal display 17 in the main door 13, a lower image display panel 16 is provided. The lower image display panel 16 includes a transmissive liquid crystal panel and various items of information about the game, effect images, etc., are displayed thereon during the game.

The lower image display panel 16 is provided with a credit number display 31 and a payout number display 32. The credit number display 31 displays the number of credited coins in an image. The payout number display 32 displays in an image the number of coins to be paid out when the specified start point and end point are linked by the stopped symbols.

The lower image display panel 16 (display) scrolls symbols shown in Fig. 3 in the display areas (28a to 28o). Each symbol column consists of 10 symbols shown in Fig. 3. After scrolling symbols in the display areas 28 (28a to 28o), the lower image display panel 16 stops the symbols in each of the display areas 28 (28a to 28o). In other words, the lower image display panel 20 16 can display a symbol matrix.

Further, on the front of the lower image display panel 16, a touch panel 69 (refer to Fig. 6) is provided and thereby a player can input various directions by operating the touch panel 69.

Below the lower image display panel 16, a control panel 20 25 including a plurality of buttons 23 to 27 for a player to input directions relating to the progress of a game, the coin receiving slot 21 for receiving coins into the cabinet 11, and a bill

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validator 22 are provided.

The control panel 20 is provided with the spin button 23, a change button 24, a cashout button 25, a 1-BET button 26, and a maximum BET button 27. The spin button 23 is a button to input a direction to start the scroll of the symbols displayed in the display areas 28. The change button 24 is a button to request a personnel in the gaming facility for exchange. The cashout button 25 is a button to input a direction to pay out credited coins onto a coin tray 18.

The 1-BET button 26 is a button to input a direction to bet one coin of the credited coins on a game. The maximum BET button 27 is a button to input a direction to bet the maximum number of coins that can be bet on a single game (for example, 50 coins) of the credited coins.

The bill validator 22 identifies whether or not a bill is legitimate and receives a legitimate bill into the cabinet 11. In addition, it may also be possible for the bill validator 22 to be configured so as to be capable of reading a bar code ticket 39, to be described later. On the lower front of the main door 13, that is, below the control panel 20, a burry glass 34, on which the character of the slot machine 10 etc. is drawn, is provided.

On the front of the top box 12, an upper image display panel 33 is provided. The upper image display panel 33 includes a liquid crystal panel and for example, effect images and images of the introduction of the game content and the explanation of the game rules are displayed thereon.

The top box 12 is provided with a speaker 29 for outputting

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sound. On the lower side of the upper image display panel 33, a ticket printer 35, a card reader 36, a data display 37, and a keypad 38 are provided.

The ticket printer 35 prints out the bar code ticket 39 on which data of the total number of credits, the number of credits for jackpot, the date, the identification number of the slot machine 10, etc., has been encoded into bar code and printed thereon. The player can play a game with another slot machine using the bar code ticket 39 and can exchange the bar code ticket 39 with bills etc. at a cashier etc. in the gaming facility.

The card reader 36 reads and writes data from and to a smart card. The smart card is carried by a player, and in which, for example, data for identifying the player, data about the history of the games played by the player are stored.

The data display 37 is constituted by a fluorescent display etc., and displays, for example, the data read by the card reader 36 and the data input by the player through the keypad 38. Directions and data about issuance of tickets etc. are input through the keypad 38.

20 Fig. 3 is an explanatory diagram showing an example of a symbol column to be scrolled in each of the display areas 28 (28a to 28o) provided on the liquid crystal display 17 provided within the cabinet 11. As shown in Fig. 3, symbols constituting a symbol column are assigned respectively any one of code numbers "00" to  
25 "10" and in each of the display areas 28 (28a to 28o), a column of total of 10 symbols respectively assigned with each of code numbers "00" to "10" is scrolled. The order of symbols in the

symbol column may differ for each of the display areas 28 (28a to 28o), not limited to those shown in Fig. 3.

In the present embodiment, the symbol expresses a "railroad". Then, as shown in Fig. 3, an in-marker (Fig. 3: in), an out-marker (Fig. 3: out), and a direction in which a piece object can move (Fig. 3: arrow) are specified. Consequently, whether or not neighboring symbols can be linked depends on the neighboring symbols when stopped and displayed. For example, when the symbol specified by the code number "02" is arranged on the right-hand side of the symbol specified by the code number "00", both the symbols are "linked" because of the in-markers, the out-markers, and the direction specified by the arrows. However, for example, when the symbol specified by the code number "03" is arranged on the right-hand side of the symbol specified by the code number "00", both the symbols are "not linked".

In Fig. 3, the in-markers, the out-markers, and the directions are explicitly shown, however, it is only required for the controller 48 to be capable of determining whether or not symbols can be linked and determining the direction in which the object moves in its internal processing, and it is not necessarily required to explicitly express the in-marker, the out-marker, and the arrows specifying the direction of movement in actual symbols displayed on the liquid crystal display 17. Further, the symbols shown in Fig. 3 are a mere example, and it may also be possible to prepare symbols in which more in-markers, out-markers, and directions of movement are specified.

Fig. 4 shows an example of the payout (award) table for

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providing the number of credits to be paid out in accordance with the number of squares (display areas) that can be linked based on the relationship among the in-markers, the out-markers, and the directions specified in the symbols stopped and displayed by rearrangement. In addition, Fig. 5 shows an example of the odds table for setting odds in accordance with the special symbols set under the squares that can be linked. Since the special symbol has a meaning of multiplication of the number of credits to be paid out set in accordance with the number of linked squares, it is referred to as a high-odds symbol. When one high-odds symbol is set to the linked symbols, the number of credits to be paid out set in accordance with the number of linked squares is multiplied by a factor of 10, when two are set, by a factor of 100, and when three are set, by a factor of 1,000.

The payout table and the odds table shown in Fig. 4 and Fig. 5 described above are only an example, and the number of credits to be paid out, the number of high-odds symbols to be prepared, their corresponding odds, etc., are not limited to the numerical values shown in the figures. In addition, it may also be possible to set so that the number of credits to be paid out, the odds, etc., are increased in accordance with the number of bets.

In the present embodiment, a configuration may be possible in which the bonus game, a special payout, etc., are provided depending on a combination of symbols. The bonus game is not limited in particular as long as it provides a more advantageous state for the player. The bonus game more advantageous for the player is not limited in particular provided that it is more

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advantageous than the base game and such states include a state in which more game media can be obtained than the base game, a state in which the game media can be obtained with a higher possibility than the base game, a state in which less game media are consumed than the base game, etc. Specifically, the bonus game includes a free game, a second game, etc.

The symbols displayed (arranged) in each of the 15 display areas 28 (28a to 28o) start to scroll when the BET button 26 or the maximum BET button 27 is pressed and then the spin button 23 is pressed. In each of the display areas 28a to 28o, when the symbols start to scroll, after a prescribed period of time elapses, the scroll of each symbol stops simultaneously or sequentially. This state is referred to as a rearranged state. On this occasion, in each of the display areas 28 (28a to 28o), a symbol specified by any one of the code numbers in the symbol column shown in Fig. 3 stops.

Fig. 6 is a block diagram showing the control circuit of the slot machine 10 shown in Fig. 2. As shown in Fig. 6, the control circuit includes a controller 48, a main PCB (Printed Circuit Board) 60, a sub CPU 61, a door PCB 80 and various components, such as switches, sensors, etc. The controller 48 includes a motherboard 40 and a gaming board 50.

The gaming board 50 includes a CPU (Central Processing Unit) 51, a ROM 55 and a boot ROM 52 connected to one another by an internal bus, a card slot 53S corresponding to a memory card 53, and an IC socket 54S corresponding to a GAL (Generic Array Logic) 54.

The memory card 53 stores game programs and game system



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programs. The game programs include a stop symbol determination program. The stop symbol determination program is a program for determining symbols (code numbers corresponding to symbols) that stop in each of the display areas 28 (28a to 28o). The stop symbol determination program includes symbol-weighted data corresponding to respective payout rates (for example, 80%, 84%, 88%) of plural kinds. The symbol-weighted data is data showing a correspondence relationship between the code number of each symbol (refer to Fig. 3) and one or more random number values belonging to a prescribed numerical range (0 to 256) with respect to each of the display areas 28 (28a to 28o).

The payout rate is determined based on payout rate setting data output from the GAL 54 and based on the symbol-weighted data corresponding to the payout rate, the stop symbols are determined.

The card slot 53S is configured so that the memory card 53 can be inserted and removed and is connected to the motherboard 40 by an IDE bus. Consequently, by removing the memory card 53 from the card slot 53S, writing another game program and game system program to the memory card 53, and inserting the memory card 53 into the card slot 53S, it is possible to change the kinds and contents of the game played with the slot machine 10.

The game program includes programs relating to game progress and programs to transit to the bonus game. In addition, the game program includes image data and audio data output during the game. Further, the game program includes image data and audio data as notification data for notifying the player when a chain reaction game is started according to the procedure, to be described later.

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The GAL 54 includes a plurality of input ports and output ports and when data is input to the input port, it outputs data corresponding to the data from the output port. The data output from the output port is the above-described payout rate setting data.

In addition, the IC socket 54S is configured so that it can attach/remove the GAL 54 and connected to the motherboard 40 by a PCI bus. Consequently, by removing the GAL 54 from the IC socket 54S, rewriting the program stored in the GAL 54, and attaching the GAL 54 to the IC socket 54S, it is possible to change the payout rate setting data output from the GAL 54.

The CPU 51, the ROM 55, and the boot ROM 52 connected to each another by the inner bus are connected to the motherboard 40 by the PCI bus. The PCI bus transmits signals between the motherboard 40 and the gaming board 50 and at the same time, supplies electric power from the motherboard 40 to the gaming board 50. In the ROM 55, country identification information and an authentication program are stored. In the boot ROM 52, a preliminary authentication program, a program (boot code) with which the CPU 51 activates the preliminary authentication program, etc., are stored.

The authentication program is a program (falsification check program) for authenticating the game program and the game system program. The authentication program is a program for checking and proving that the game program or the game system program has not been falsified. In other words, the authentication program is described in accordance with the authentication procedure of the

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game program and the game system program. The preliminary program is a program for authenticating the above-described authentication program. The preliminary authentication program is written in accordance with the procedure for proving that the authentication program to be subjected to the authentication processing has not been falsified, that is, for authenticating the authentication program.

The motherboard 40 includes a main CPU 41, a ROM (Read Only Memory) 42, a RAM (Random Access Memory) 43, and a communication interface 44.

The main CPU 41 includes a function as a controller to control the entire slot machine 10. In particular, the main CPU 41 executes control of, when the spin button 23 is pressed after credits have been bet, outputting to the sub CPU 61 a direction signal to scroll symbols in each of the display areas 28 (28a to 28o) of the liquid crystal display 17, control of determining symbols that stop after the symbols are scrolled in each of display areas 28 (28a to 28o), and control of stopping and displaying the determined symbols as a symbol matrix.

20 After scrolling the symbol columns arranged on the display (liquid crystal display 17) in one direction, in order to rearrange them as a new symbol matrix, the main CPU 41 executes arrangement control of selecting and determining symbols to be arranged in a symbol matrix from among the plurality of symbols and stopping  
25 the scroll state to display the determined symbols.

In addition, the main CPU 41 executes control of, when symbols are arranged on the display (liquid crystal display 17)

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and if the start point and the end point set at the prescribed positions in the symbol matrix are linked based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, making a corresponding payout.

Furthermore, the main CPU 41 executes control of setting the special symbol (high-odds symbol) that can provide a special payout independent of the number of links in any of the display areas forming the symbol matrix and control of displaying the piece object for notifying the symbols linked based on the relationship among the in-marker, the out-marker, and the direction.

Then, the main CPU 41 determines a payout in accordance with the number of linked squares when symbols are rearranged in the symbol matrix with 5×3 squares and if the square as the prescribed start point through the square as the end point in the symbols matrix are linked. Then, when there exists the high-odds symbol under the linked squares, a payout in relation to the odds determined by the high-odds symbol is given, in addition to the payout due to the number of squares.

When the jackpot payout is made in the slot machine 10, the  
20 main CPU 41 accumulatively saves part of credits to be paid out to the player as credits for jackpot in the slot machine 10, and determines whether or not to payout the credits for jackpot accumulatively saved when the number of credits becomes equal to or exceeds a prescribed jackpot threshold value (for example,  
25 "500"). The main CPU 41 pays out the credits for jackpot when a symbol link pattern indicative of the jackpot payout is formed in the display areas 28f to 28i.

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As in the slot machine 10, in a slot machine of standalone type, the jackpot credits are saved in the RAM 43. In contrast to this, in the case of a slot machine corresponding to the progressive system to which a plurality of slot machines and a management server are connected, part of credits paid out to the player at each slot machine is saved in the management server and the payout of credits is made from the management server for the slot machine that has satisfied prescribed conditions.

The main CPU 41 outputs a scroll direction signal to the effect that each of the display areas 28 (28a to 28o) scrolls symbols in the base game execution processing to a graphic board 68. The graphic board 68 controls the lower image display panel 16 based on the scroll direction signal. The lower image display panel 16 scrolls symbols in each of the display areas 28 (28a to 28o) by the control by the graphic board 68 (in other words, control by the main CPU 41). In other words, the main CPU 41 determines symbols to stop in each of the display areas 28 (28a to 28o) and outputs a stop direction signal about the determined symbol to the graphic board 68. The graphic board 68 controls the lower image display panel 16 based on the stop direction signal. The lower image display panel 16 stops and displays the determined symbol by the control by the graphic board 68. Then, the main CPU 41 determines a payout in accordance with the number of links and calculates its payout when the symbols from the start point to the end point set in the symbol matrix can be linked in accordance with the combination when all of the symbols in the display areas 28 are stopped by the control by the graphic board 68.

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In the ROM 42, programs, such as the BIOS (Basic Input/Output System) etc. to be executed by the main CPU 41, are stored and data to be used permanently is stored. When the main CPU 41 executes the BIOS, initialization processing of each peripheral is performed and at the same time, read processing of the game program and game system program stored in the memory card 53 via the gaming board 50 is started. In addition, the ROM 42 is also used as a memory for storing a combination accompanied by payout and the number of credits to be paid out in accordance with the combination.

In the RAM 43, data and programs used when the main CPU 41 performs processing are stored. In addition, in the case where the slot machine 10 is a so-called slot machine of standalone type, the number of jackpot credits is stored in the RAM 43.

The communication interface 44 is used to communicate with the host computer etc. provided in the gaming facility via a communication line.

To the motherboard 40, the main PCB (Printed Circuit Board) 60 and the door PCB 80, to be described later, are connected respectively by the USB (Universal Serial Bus). Further, to the motherboard 40, a power supply unit 45 is connected. When electric power is supplied from the power supply unit 45 to the motherboard 40, the main CPU 41 of the motherboard 40 is activated and at the same time, electric power is supplied to the gaming board 50 by the PCI bus and the CUP 51 is activated.

The controller 48 includes the respective configurations of the motherboard 40 and the gaming board 50 described above. The

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controller 48 executes arrangement control of, after scrolling the plurality of symbols arranged on the lower image display panel 16, selecting and determining symbols to be arranged in the symbol matrix from among the plurality of symbols having different attributes, and stopping the scroll state to display the determined symbols, and displays the piece object for notifying the player of the symbols that can be linked based on the relationship among the in-marker, the out-marker, and the direction when the symbols are arranged on the lower image display panel 16. In addition, the controller sets the special symbol (referred to as the high-odds symbol in the present embodiment) for providing a special payout independent of the number of linked symbols. Then, the controller 48 executes a series of processing to make a payout in accordance with the number of linked symbols and the special symbol when the start point and the end point set at the prescribed positions in the symbol matrix are linked based on the relationship among the in-marker, the out-marker, and the direction in symbols neighboring one another.

20 To the main PCB 60 and the door PCB 80, equipment and devices to generate input signals to be input to the main CPU 41 and equipment and devices the operation of which is controlled by the control signal output from the main CPU 41 are connected. By executing the game program and the game system program stored in the RAM 43 based on the input signal input to the main CPU 41,  
25 the main CPU 41 performs arithmetic processing and stores its result in the RAM 43 and performs processing to transmit the control signal to each of the equipment and devices as control processing

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for each of the equipment and devices.

To the main PCB 60, a lamp 30, the sub CPU 61, a hopper 66, a coin detector 67, the graphic board 68, the speaker 29, the touch panel 69, the bill validator 22, the ticket printer 35, the card reader 36, a key switch 38s, and the data display 37 are connected. Further, to the main PCB 60, a stop switch 82 and a display lamp 83 provided corresponding to the stop switch 82 are connected.

The lamp 30 is controlled so that it lights up or lights off based on the control signal output from the main CPU 41.

The sub CPU 61 controls the scroll of symbols in each of the display areas 28 (28a to 28o) set on the liquid crystal display 17 and is connected with a VDP (Video Display Processor) 46.

The VDP 46 reads image data of symbols stored in an image data ROM 47, generates a scroll image to be displayed on the liquid crystal display 17, and outputs the scroll image to the liquid crystal display 17.

The hopper 66 is installed inside the cabinet 11 and pays out a prescribed number of coins onto the coin tray 18 from a coin payout opening 19 based on the control signal output from the main CPU 41. The coin detector 67 is provided inside the coin payout opening 19 and outputs an input signal to the main CPU 41 when detecting that the prescribed number of coins has been paid out from the coin payout opening 19.

The graphic board 68 controls the image display other than that of the symbols displayed in the display areas 28 on the upper image display panel 33 and the lower image display panel 16 based on the control signal output from the main CPU 41. In the credit



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number display 31 of the lower image display panel 16, the number of credits stored in the RAM 43 is displayed. In the payout number display 32 of the lower image display panel 16, the number of coins paid out is displayed. In addition, the graphic board 68 includes a VDP that generates image data based on the control signal output from the main CPU 41, a video RAM that temporarily stores image data generated by the VDP, etc.

The bill validator 22 reads the image of a bill and receives a legitimate bill into the cabinet 11. When receiving a legitimate bill, the bill validator 22 outputs an input signal to the main CPU 41 based on the amount of the bill. The main CPU 41 stores the number of credits in accordance with the amount of the bill transmitted by the input signal in the RAM 43.

The ticket printer 35 prints out barcode, into which data, such as the number of credits stored in the RAM 43, date, the identification number of the slot machine 10, etc., is encoded, onto a ticket and outputs it as the barcode ticket 39.

The card reader 36 reads data from the smart card and transmits it to the main CPU 41 and writes data to the smart card based on the control signal from the main CPU 41. The key switch 38s is provided to the keypad 38 and outputs an input signal to the main CPU 41 when a player operates the keypad 38.

The data display 37 displays data read by the card reader 36 and data input by a player via the keypad 38 based on the control signal output from the main CPU 41.

To the door PCB 80, the control panel 20, a reverter 21s, a coin counter 21c, and a cold cathode tube 81 are connected. The

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control panel 20 is provided with a spin switch 23S corresponding to the spin button 23, a change switch 24S corresponding to the change button 24, a cashout switch 25S corresponding to the cashout button 25, a 1-BET switch 26S corresponding to the 1-BET button 26, and a maximum BET switch 27S corresponding to the maximum button 27. Each of the switches 23S to 27S outputs an input signal to the main CPU 41 when a player operates each of the corresponding buttons 23 to 27.

The coin counter 21C is provided inside the coin receiving slot 21 and validates whether or not the coin inserted into the coin receiving slot 21 by a player is legitimate. Coins other than legitimate ones are ejected from the coin payout opening 19. In addition, the coin counter 21C outputs an input signal to the main CPU 41 when detecting the legitimate coin.

The reverter 21S operates based on the control signal output from the main CPU 41 and distributes the coins validated to be legitimate ones by the coin counter 21C to the cash box (not shown) or the hopper 66 provided within the slot machine 10. In other words, when the hopper 66 is filled with coins, the legitimate coins are distributed to the cash box by the reverter 21S. On the other hand, when the hopper 66 is not filled with coins, the legitimate coins are distributed to the hopper 66.

The cold cathode tube 81 functions as a backlight installed on the backside of the lower image display panel 16 and the upper image display panel 33 and lights up based on the control signal output from the main CPU 41.

Next, specific processing performed in the slot machine 10

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is described. Fig. 7 is a flow chart showing the procedure of authentication read processing (processing in step S100 shown in Fig. 1) of the game program and the game system program by the motherboard 40 and the gaming board 50 shown in Fig. 6. Here, it is assumed that the memory card 53 is attached to the card slot 53S of the gaming board 50 and the GAL 54 is attached to the IC socket 54S.

First, when the power switch is turned on in the power supply unit 45, the motherboard 40 and the gaming board 50 are activated (step S1-1, S2-1). When the motherboard 40 and the gaming board 50 are activated, processing is performed at the same time, individually. In other words, on the gaming board 50, the CPU 51 reads the preliminary authentication program stored in the boot ROM 52 and carries out preliminary authentication to check and prove that the authentication program has not been falsified in accordance with the read preliminary authentication program before taken into the motherboard 40 (step S2-2).

On the other hand, on the motherboard 40, the main CPU 41 executes the BIOS stored in the ROM 42 and decompresses the compressed data incorporated in the BIOS into the RAM 43 (step S1-2). Then, the main CPU 41 executes the BIOS decompressed in the RAM 43 and diagnoses and initializes the various peripheral devices (step S1-3).

Then, since the ROM 55 of the gaming board 50 is connected to the main CPU 41 by the PCI bus, the main CPU 41 reads the authentication program stored in the ROM 55. Further, the main CPU 41 performs processing to store the read authentication program

in the RAM 43 (step S1-4).

Next, the main CPU 41 accesses the memory card 53 attached to the card slot 53S via the IDE bus. Then, the main CPU 41 reads the game program and the game system program stored in the memory card 53.

Next, the main CPU 41 carries out authentication to check and prove that the read game program or game system program has not been falsified in accordance with the authentication program stored in the RAM 43 (step S1-5).

When the authentication processing is completed normally, the main CPU 41 stores the authenticated game program and game system program in the RAM 43 (step S1-6). Next, the main CPU 41 accesses the GAL 54 attached to the IC socket 54S via the PCI bus and reads the payout rate setting data from the GAL 54, and stores it in the RAM 43 (step S1-7). Next, the main CPU 41 reads the country identification information stored in the ROM 55 of the gaming board 50 via the PCI bus and stores the read country identification information in the RAM 43 (step S1-8).

After performing the above-described processing, the main CPU 41 advances the base game described below by sequentially reading and executing the game program and the game system program.

After the authentication read processing shown in Fig. 7 is performed, the main CPU 41 carries out the execution processing of the base game. Fig. 8 is a flow chart showing the specific processing procedure of the base game execution processing shown in step S200 in Fig. 1.

In the base game execution processing, first, the main CPU

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41 determines whether or not a coin(s) has been bet (step S11). In this processing, the main CPU 41 determines whether or not it has received an input signal output from the 1-BET switch 26S when the 1-BET button 26 is pressed or an input signal output from the maximum BET switch 27S when the maximum BET button 27 is pressed. When the main CPU 41 determines that no coin has been bet, it returns the processing to step S11.

On the other hand, when it is determined that a coin(s) has been bet in step 11, the main CPU 41 performs processing to reduce the number of credits stored in the RAM 43 in accordance with the number of coins bet (step S12). If the number of coins bet is greater than the number of credits stored in the RAM 43, the main CPU 41 does not perform the processing to reduce the number of credits stored in the RAM 43 and returns the processing to step S11. In addition, when the number of coins bet exceeds the upper limit value that can be bet on a single game (50 coins in the present embodiment), the main CPU 41 does not perform the processing to reduce the number of credits stored in the RAM 43 and advances the processing to step S13. In this manner, a state is established in which symbols can be scrolled in the display areas 28 (28a to 28o).

Next, the main CPU 41 determines whether or not the spin button 23 has been turned ON (step S13). In this processing, the main CPU 41 determines whether or not it has received an input signal output from the spin switch 23S when the spin button is turned ON. When the main CPU 41 determines that the spin button 23 has not been turned ON, it returns the processing to step S11.

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When the spin button 23 has not been turned ON (for example, the spin button 23 has not been turned ON but a game ending direction is input), the main CPU 41 cancels the result of reduction in step S12.

In the present embodiment, a case is described, in which after a coin(s) has been bet and before whether or not the spin button 23 has been turned ON is determined (step S13), the processing to reduce the number of credits is performed (step S12). However, the present invention is not limited to this example. For example, after a coin(s) has been bet (step S11), whether or not the spin button 23 has been turned ON is determined (step S13), and when it is determined that the spin button 23 has been turned ON (YES in step S13), the processing to reduce the number of credits may be performed (step S12).

Then, when it is determined that the spin button 23 has been turned ON, the main CPU 41 performs stop symbol determination processing (step S14). In the stop symbol determination processing, the main CPU 41 executes the scroll control processing of symbols (step S15) by executing the stop symbol determination program stored in the RAM 43 and determines symbols to be displayed when they stop in each of the display areas 28 (28a to 28o).

Next, the main CPU 41 performs the scroll processing of symbols (step S15). In this processing, after the scroll of symbols is started in each of the display areas 28 (28a to 28o), the symbols determined in step S14 are stopped in each of the display areas 28 (28a to 28o). The details of the stop symbol determination processing and the scroll control processing will

be described later using Fig. 9 and Fig. 10, respectively.

Next, the main CPU 41 determines a start square from which the piece object is started (step S16). Then, the main CPU 41 determines whether or not there is a symbol link portion in the symbol matrix stopped and displayed by the scroll control processing (step S17). When there is a link portion, in other words, when it is possible to advance the piece object to a neighboring symbol in any direction by the in-markers, the out-markers, and the directions specified in the symbol, the piece object is moved along the corresponding symbols. The main CPU 41 determines whether or not the square of the end point (goal) has been reached (step S18), and when the end point has been reached (YES in step S18), payout processing is performed in accordance with the payout table shown in Fig 4 (step S19). In addition, when the special symbol (high-odds symbol) that can provide a special payout independent of the number of links is set in any one of the linked display areas, payout processing is performed with reference to the odds table shown in Fig. 5.

When part of credits to be paid out is saved, the main CPU  
20 41 adds a prescribed number of credits to the number of credits  
stored in the RAM 43. When paying out credits, the main CPU 41  
transmits a control signal to the hopper 66 and pays out a  
prescribed number of credits. On this occasion, the coin detector  
67 counts the number of coins paid out from the hopper 66 and when  
25 the counted value reaches a specified number, it transmits a payout  
completion signal to the main CPU 41. With this, the main CPU 41  
terminates the drive of the hopper 66 and the coin payout processing

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is completed.

On the other hand, when the goal has not been reached (NO in step S18), whether or not there is a symbol link portion is determined again (step S17). Further, when it is no longer possible to move the object in any direction toward any neighboring symbol before the goal has been reached (NO in step S17), in other words, when losing, no payout of credits is made. In this manner, the base game is executed.

The base game in the embodiment of the present invention, described using Fig. 8, will be described specifically using the display example of the symbol matrix in the display areas 28 shown in Fig. 11 to Fig. 16. Here, the transverse five squares \* longitudinal three squares shown in Fig. 11 to Fig. 16 correspond to the respective display areas 28 (28a to 28o) of the liquid crystal display 17 shown in Fig. 2.

When the spin button 23 is pressed by a player in a state in which a desired number of credits has been bet by the insertion of coins into the coin receiving slot 21 etc., the scroll of the symbol column is started in each of the display areas (28a to 28o) of the liquid crystal display 17 provided on the front of the cabinet 11. On this occasion, the main CPU 41 executes stop symbol determination processing and symbols to be stopped and displayed in each of the display areas 28 (28a to 28o) are determined. Then, the scroll of the symbols stops due to the scroll control processing by the main CPU 41 and symbols stop (are rearranged) in each of the display areas 28 (28a to 28o) with 5\*3 squares, that is, 15 squares in total. It is assumed here that a symbol matrix shown



in Fig. 11 is formed.

In other words, this symbol matrix is formed when the symbol with code number "09" is stopped and displayed in the display area 28a, the symbol with code number "05", in the display area 28b, the symbol with code number "01", in the display area 28c, the symbol with code number "03", in the display area 28d, the symbol with code number "06", in the display area 28e, the symbol with code number "09", in the display area 28f, the symbol with code number "06", in the display area 28g, the symbol with code number "09", in the display area 28h, the symbol with code number "02", in the display area 28i, the symbol with code number "10", in the display area 28j, the symbol with code number "09", in the display area 28k, the symbol with code number "05", in the display area 28l, the symbol with code number "02", in the display area 28m, the symbol with code number "03", in the display area 28n, and the symbol with code number "09", in the display area 28o.

However, it may also be possible to carry out the effect that the entire symbol matrix formed when symbols being scrolled are stopped and displayed is hidden with the next timing, for example, as shown in Fig. 12. By displaying the symbol links in such a manner that it is hard for the player to recognize them, it is possible to enhance a sense of expectation of the player.

Then, the start square is determined by the processing in step S16. As shown in Fig. 12, in the present embodiment, piece objects 101A, 101B, and 101C expressed as a "locomotive" are displayed and the main CPU 41 determines from which of the upper tier, the middle tier, and the lower tier the symbol is started.

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On this occasion, if the piece object indicative of the selected start square is caused to flash, it is possible to notify the player of the selected start square.

In Fig. 12, the piece object 101B is displayed in a flashing state. In other words, it means that the display area 28f is determined as the start square. By the way, the player may select the start position of the piece object with the touch panel etc.

After that, as shown in Fig. 13, with an effect image 102 in which the hidden parts of the display appear one after another, the player can gradually recognize part of the symbol matrix visually. The main CPU 41 determines whether or not there is a symbol link portion in the symbol matrix stopped and displayed by the scroll control processing (step S17). When there is a link portion, that is, when the piece object 101B can move to a neighboring symbol in any direction based on the in-markers, the out-markers, and the directions specified in the symbols as shown in Fig. 3, an effect image in which the piece object 101B moves along the corresponding symbols is displayed.

As shown in Fig. 14, Fig. 15, if a gold ingot symbol 103A is set as the special symbol that can provide a special payout independent of the number of links is set on the way in the linked display areas, it is possible to obtain odds associated with the odds table. Since the gold ingot symbol as the special symbol is a symbol that provides high odds, it is also referred to as a high-odds symbol.

In the base game, there may be the case where whether or not there is a symbol link portion is determined and the result is

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negative. In addition, there may be an example as one in which a payout of credits is not obtained, in which even if the gold ingot symbols 103A is obtained, a line leading to the dead end is selected and the piece object 101B cannot move any more, as shown in Fig. 15. In this case, no payout is made.

As shown in Fig. 16, when it is possible to link the symbols until the square (display area 28o) at the end point (goal) set in the symbol matrix is reached, the completion of the link is notified to the player by the turning on of the respective symbols linking the square at the start point and the square at the end point, or the turning off of the symbols other than those in the display areas in question. At this point of time, the player can obtain a payout of credits for the first time. When the high-odds symbol (the gold ingot symbol 103A shown in Fig. 14) is set to the linked symbols, this high-odds symbol is also displayed. In the display example in Fig. 16, from the square (display area 28f) at the start point to the square (display area 28o) at the end point, the symbols are linked in the order of the display area 28f, the display area 28g, the display area 28h, the display area 28i, the display area 28n, and the display area 28o. Further, the figure shows that the gold ingots 103A, 103B have been obtained in the squares (display areas 28h, 28n) on the way. As a result, a payout of credits "20" based on the payout table and the odds table in Fig. 4, Fig. 5 and the high-odds symbol "x100" are obtained and the number of credits 2,000 will be provided.

As described above, in the base game as the embodiment of the present invention, when the symbols are linked from the

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prescribed start point to end point set in the symbol matrix, a payout results for the first time in accordance with the number of linked symbols. In other words, a payout can result from conditions different from those of the conventional effective line. In addition, in the present embodiment, it is possible to cause a player to have a sense of higher expectation by providing a new entertainment property that a payout is added to the "payout to the player" or it is multiplied depending on the number of linked symbols and the special symbol.

The payout table and the odds table in Fig. 4 and Fig. 5 described in the present embodiment are mere examples, not limiting. Further, the display examples during the execution of the base game using Fig. 11 to Fig. 16 are also mere examples, not limiting. Furthermore, as the special symbol, such a symbol with the setting that the obtained payout is reduced may be accepted, in addition to the high-odds symbols.

Fig. 9 is a flow chart showing the scroll control processing of symbols shown in step S17 in Fig. 8. This processing is performed when the main CPU 41 executes the stop symbol determination program stored in the RAM 43.

First, the main CPU 41 selects a random number value corresponding to each of the display areas 28 from the numerical value range of 0 to 255 by executing the random number generation program included in the stop symbol determination program (step S51).

Next, the main CPU 41 refers to the symbol-weighted data in accordance with the payout rate setting data output from the GAL

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54 and stored in the RAM 43. Further, the main CPU 41 determines code numbers (refer to Fig. 3) of the symbols to be stopped and displayed in each of the display areas 28 with a total of 15 squares, that is, 5×3 squares based on the selected five random number values (step S52). In addition, the main CPU 41 determines the code number of each of the display areas 28 as well as determining whether or not the start point through the end point set in the symbol matrix can be linked.

Fig. 10 is a flow chart showing the scroll processing of symbols shown in step S18 in Fig. 8. This processing is performed between the main CPU 41 and the sub CPU 61.

First, the main CPU 41 transmits a start signal to the effect that the scroll of symbols is started in the display areas 28 of the liquid crystal display 17 to the sub CPU 61 (step S61). When receiving the start signal from the main CPU 41, the sub CPU 61 outputs a symbol scroll direction to the VDP 46. The VDP 46 reads image data of the symbols stored in the image data ROM 47 and scrolls the symbols in the five columns of the display areas 28 of the liquid crystal display 17 (step S71). Due to this, the scroll of symbols starts in the five columns of the display areas 28.

After transmitting the start signal to the sub CPU 61 in step 61, the main CPU 41 executes the effect when scrolling symbols (step S62). In this processing, images are displayed on the lower image display panel 16, sound is output from the speaker 29, etc., over the period of time (for example, three seconds) specified in accordance with the result etc. of the stop symbol determination processing (step S17 in Fig. 9).

Next, the main CPU 41 determines whether or not it is a timing of the direction to stop the scroll (step S63 in Fig. 12).

When it is determined not to be the timing of the direction to stop the scroll in the processing in step S63, the processing is returned to step S63 and the effect when scrolling is continued. On the other hand, when it is determined to be the timing of the direction to stop the scroll in the processing in step S63, the main CPU 41 transmits the code numbers of the symbols stored in the RAM 43 to the sub CPU 61 (step S64). When receiving the code numbers of the symbols from the main CPU 41, the sub CPU 61 determines the stop positions of the scroll so as to correspond to the code numbers (step S72).

After that, the scroll stop processing is performed and the symbols stop and are displayed in each of the display areas 28 (step S73). In addition, the display processing of effect images by the main CPU 41 is terminated (step S65).

Hereinbefore, a slot machine in an embodiment of the present invention is described, however, the specific examples are only illustrative, not particularly limiting the present invention and the specific configuration of each means can be adequately modified in design. In addition, the effects described in the embodiments of the present invention are only enumerated from most preferred ones resulting from the present invention and the effects of the present invention are not limited by those described in the embodiments of the present invention.

The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A slot machine comprising:

a display on which display areas are formed in a matrix form, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and

a controller operable to:

after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix,

(a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and

(b) stop the scroll state to display the determined symbols;

and

when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another,

(c) provide an award in accordance with the number of the linked symbols.

2. The slot machine according to claim 1, wherein:

the controller is further operable to display an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction.



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3. The slot machine according to claim 1, wherein:  
the controller is further operable to

(d) set a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix, and

(e) provide an award in accordance with the special symbol and the number of links of the linked symbols.

4. A slot machine comprising:

a display on which display areas are formed in a matrix form, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and

a controller operable to:

after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix,

20 (a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and

(b) stop the scroll state to display the determined symbols;

(c) display an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker,  
25 and the direction; and

when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol

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matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another,

(d) provide an award in accordance with the number of the linked symbols.

5. The slot machine according to claim 4, wherein:  
the controller is further operable to:

(e) set a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix; and

(f) provide an award in accordance with the special symbol and the number of links of the linked symbols.

6. A slot machine comprising:

a display on which display areas are formed in a matrix form, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, and which arranges a symbol matrix of symbols stopped and displayed in each of the display areas; and

a controller operable to:

after scrolling the symbol columns arranged on the display in one direction, in order to rearrange them as a new symbol matrix,

(a) select and determine symbols to be arranged in the symbol matrix from among the plurality of symbols, and

(b) stop the scroll state to display the determined symbols;

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(c) set a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix;

(d) display an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction; and

when the symbols are arranged on the display and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another,

(e) provide an award in accordance with the number of links of the linked symbols.

7. A playing method of a slot machine, comprising:

an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from among the plurality of symbols, and stopping the scroll state to display the determined symbols to rearrange them as a new symbol matrix; and

an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set

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at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

8. The playing method of a slot machine according to claim 7, further comprising:

a display step of displaying an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction.

9. The playing method of a slot machine according to claim 7, wherein: a special symbol that can provide a special award independent of the number of links is set in any of the display areas forming the symbol matrix, and in the award step, an award is provided in accordance with the special symbol set in any of the display areas and the number of links of the linked symbols.

20 10. A playing method of a slot machine, comprising:

an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from

25

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among the plurality of symbols, and stopping the scroll state to display the determined symbols in order to rearrange them as a new symbol matrix;

a step of displaying an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction: and

an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

11. The playing method of a slot machine according to claim 10, wherein: a special symbol that can provide a special award independent of the number of links is set in any of the display areas forming the symbol matrix, and in the award step, an award is provided in accordance with the special symbol set in any of the display areas and the number of links of the linked symbols.

12. A playing method of a slot machine, comprising:

an arrangement step of forming a symbol matrix by arranging display areas in a matrix form on a display, the display areas scrolling symbol columns in which a plurality of symbols in which an in-marker indicative of an entrance, an out-marker indicative of an exit, and a direction are specified is arranged, selecting

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and determining, after scrolling the arranged symbol columns in one direction, symbols to be arranged in the symbol matrix from among the plurality of symbols, and stopping the scroll state to display the determined symbols in order to rearrange them as a new symbol matrix;

a step of setting a special symbol that can provide a special award independent of the number of links in any of the display areas forming the symbol matrix;

a step of displaying an object in order to notify the symbols linked based on the relationship among the in-marker, the out-marker, and the direction: and

an award step of, when the symbols are arranged on the display in the arrangement step and if a start point and an end point set at prescribed positions in the symbol matrix are linked to each other based on the relationship among the in-markers, the out-markers, and the directions in the symbols neighboring one another, providing an award in accordance with the number of links of the linked symbols.

FIG. 1

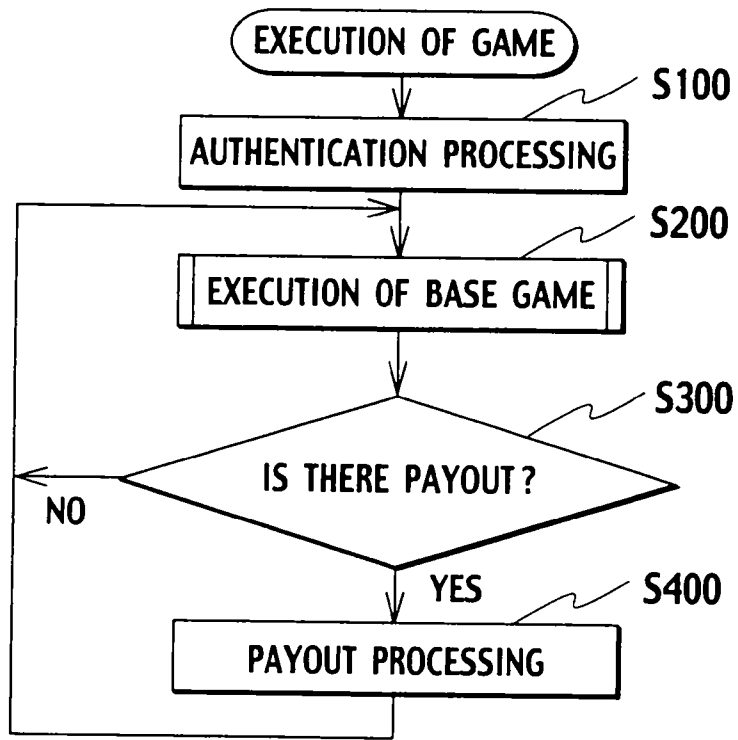


FIG. 2

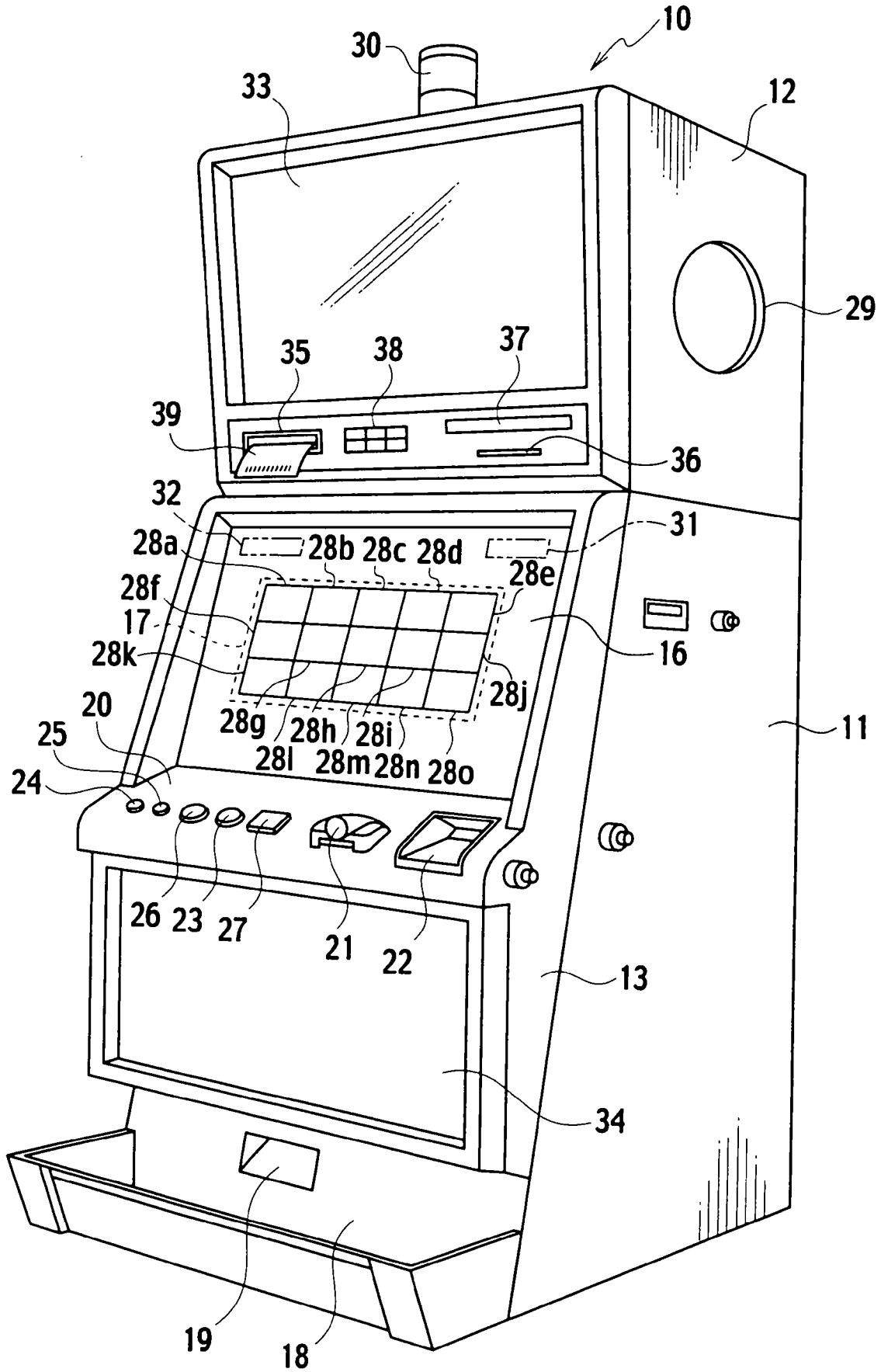




FIG. 3

CODE No.	SYMBOL
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	

**FIG. 4**

<b>NUMBER OF LINKED SQUARES</b>	<b>CREDITS TO BE PAID OUT</b>
5	10
6	20
7	30
8	40
9	50
10	60
11	70
12	80
13	90
14	100
15	200

**FIG. 5**

<b>NUMBER OF HIGH-ODDS SYMBOLS</b>	<b>ODDS</b>
1	×10
2	×100
3	×1000

FIG. 6

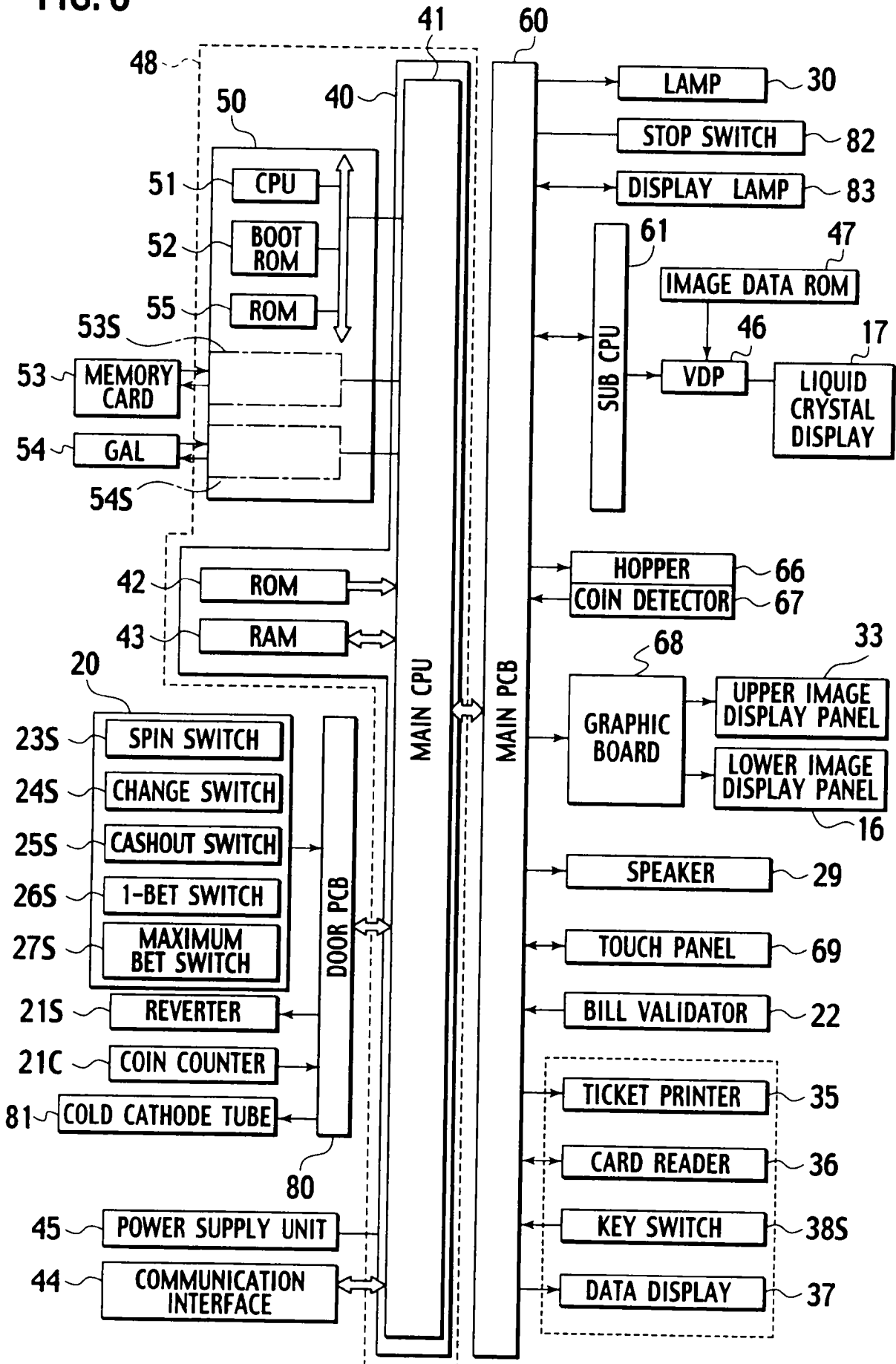


FIG. 7

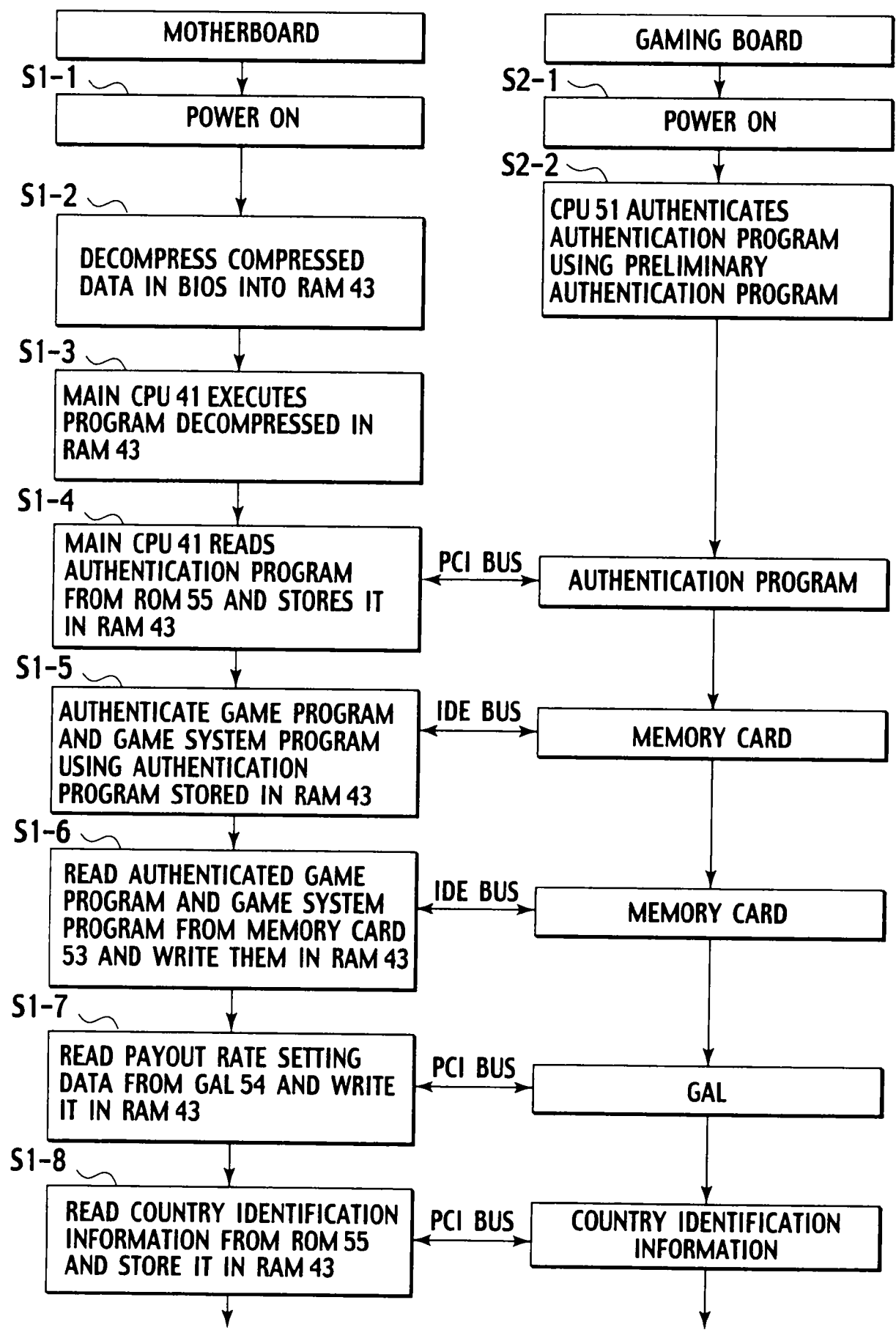


FIG. 8

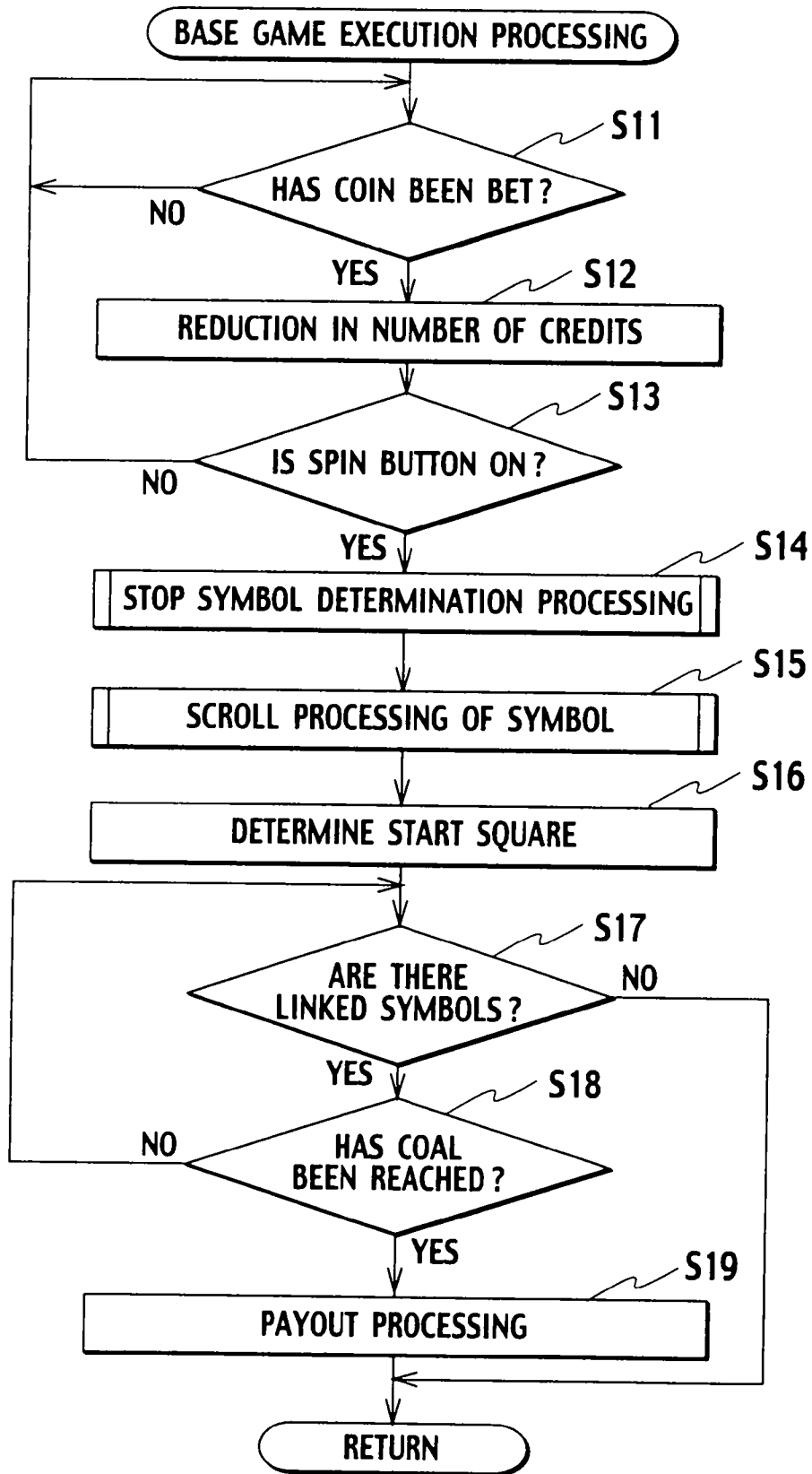


FIG. 9

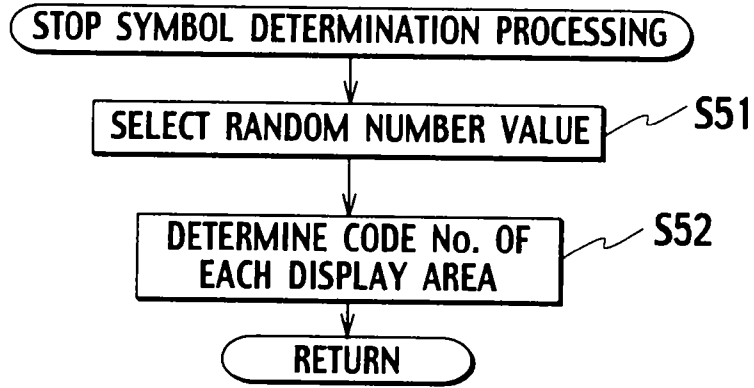


FIG. 10

(SCROLL PROCESSING OF SYMBOL)

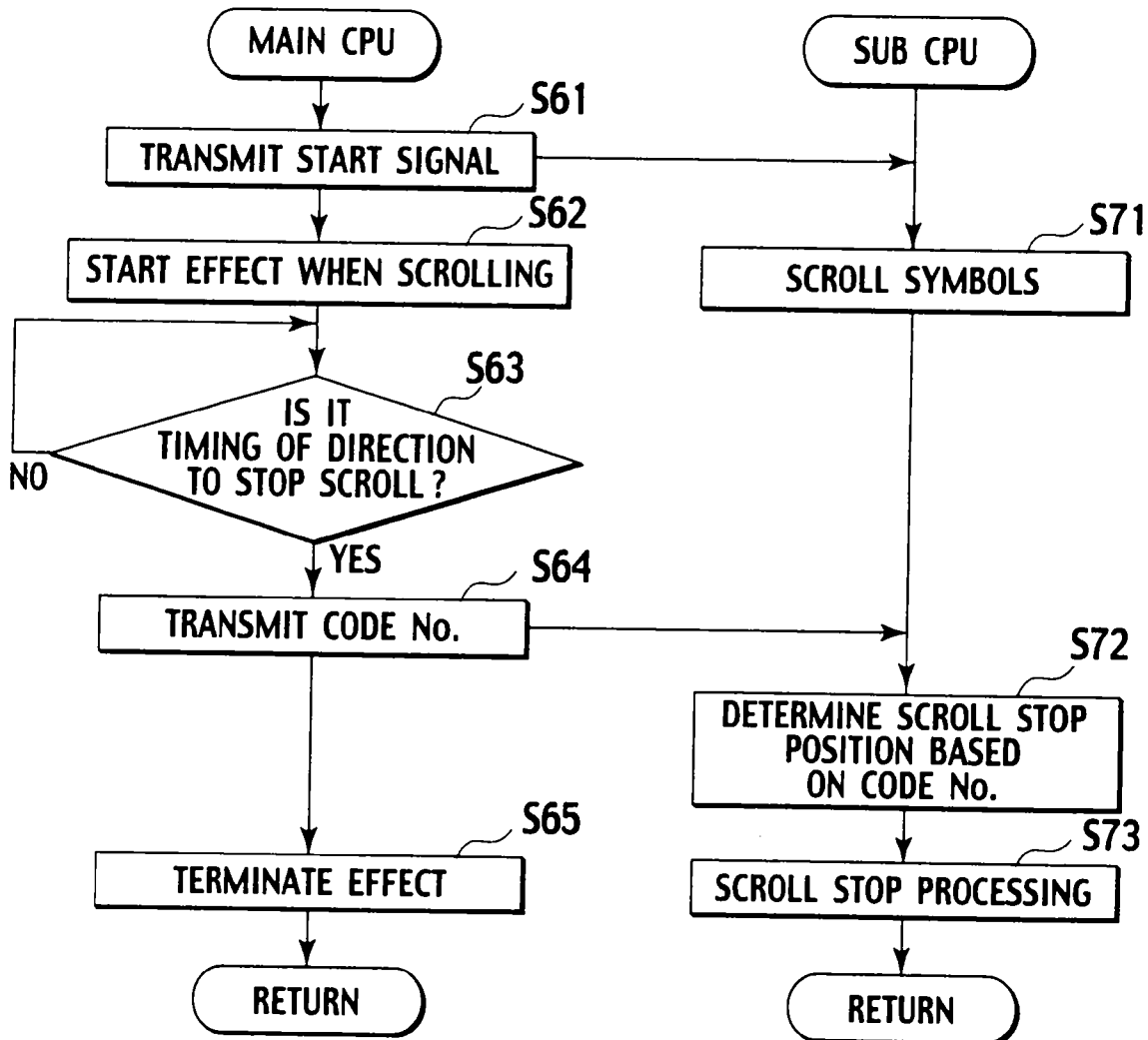


FIG. 11

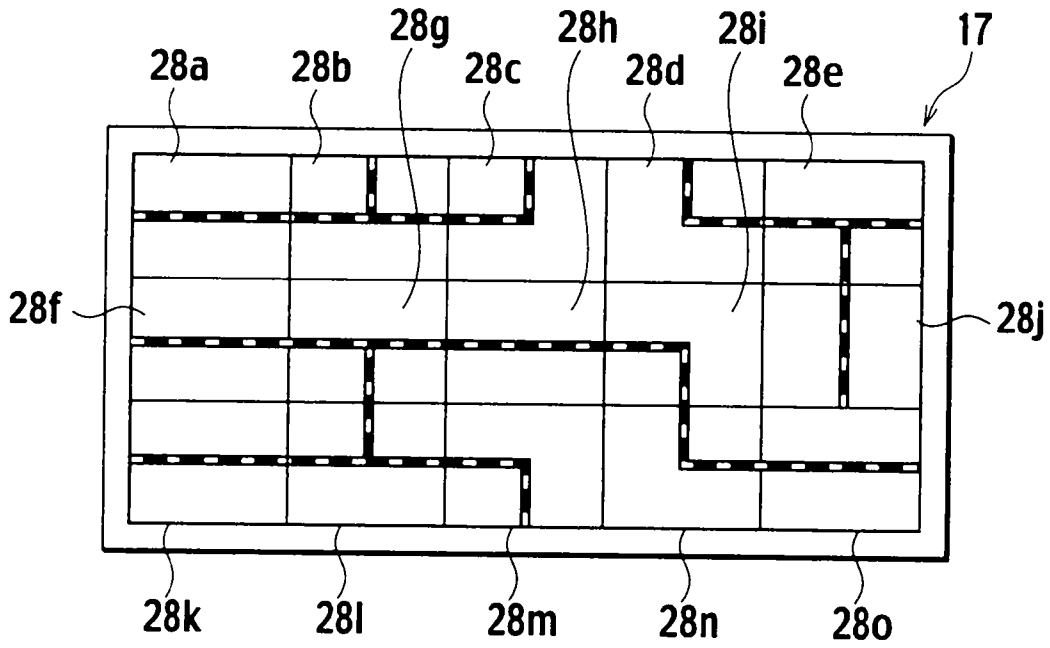


FIG. 12

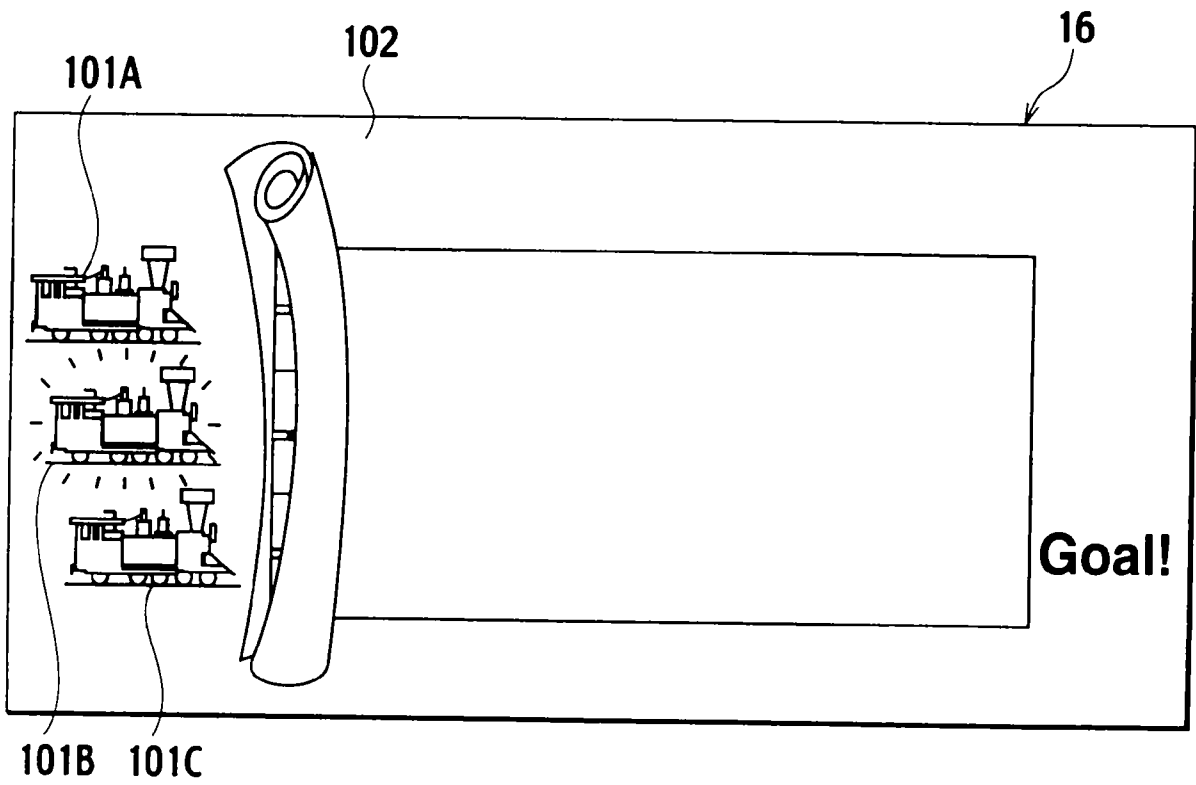


FIG. 13

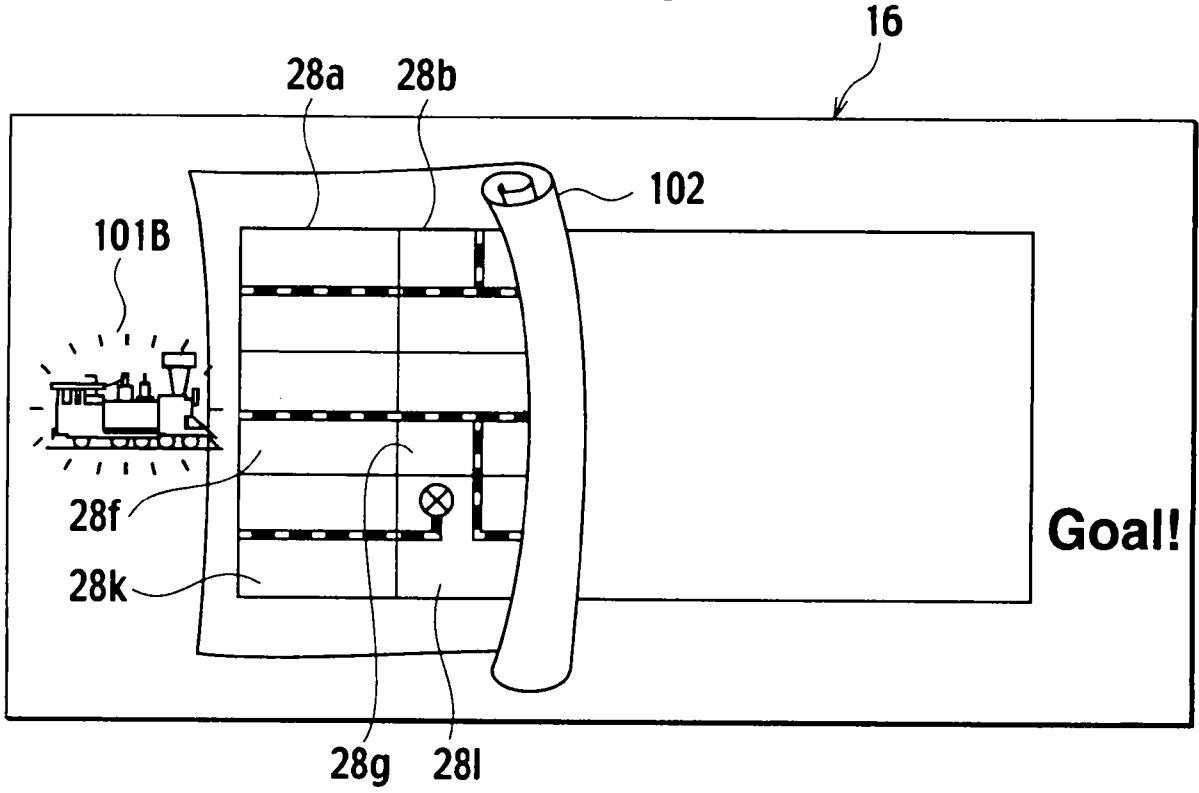
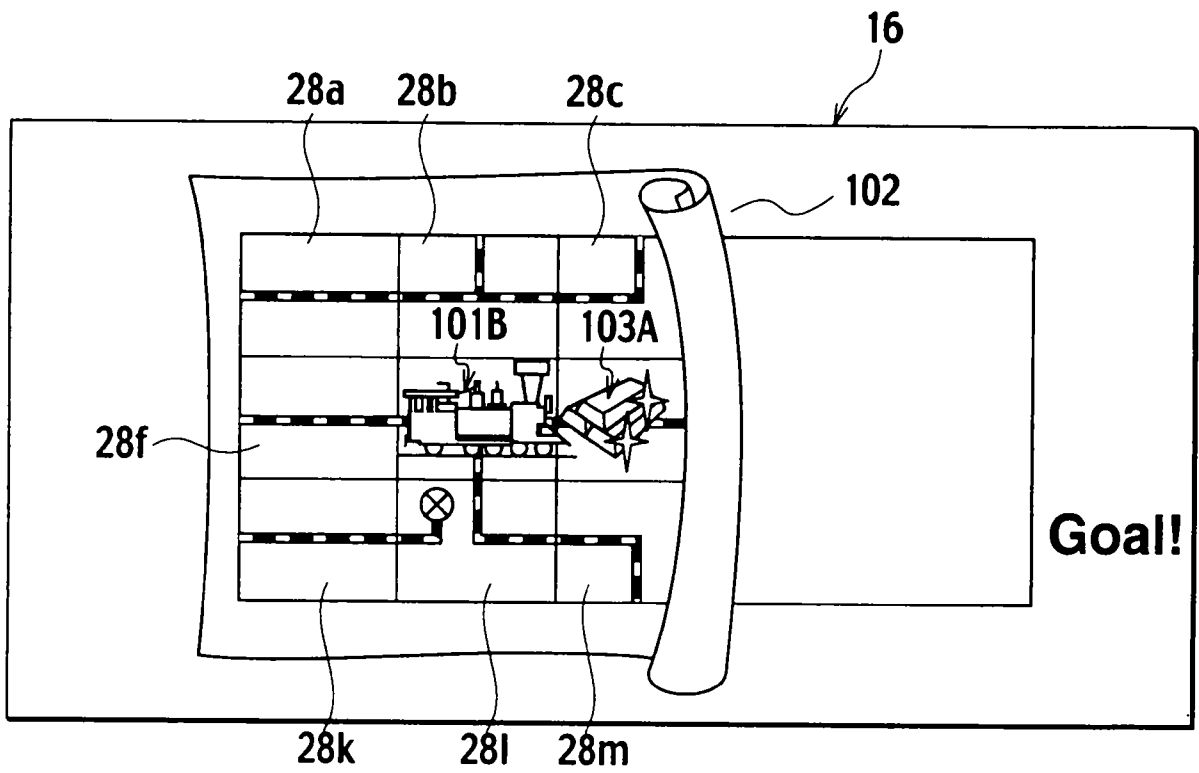
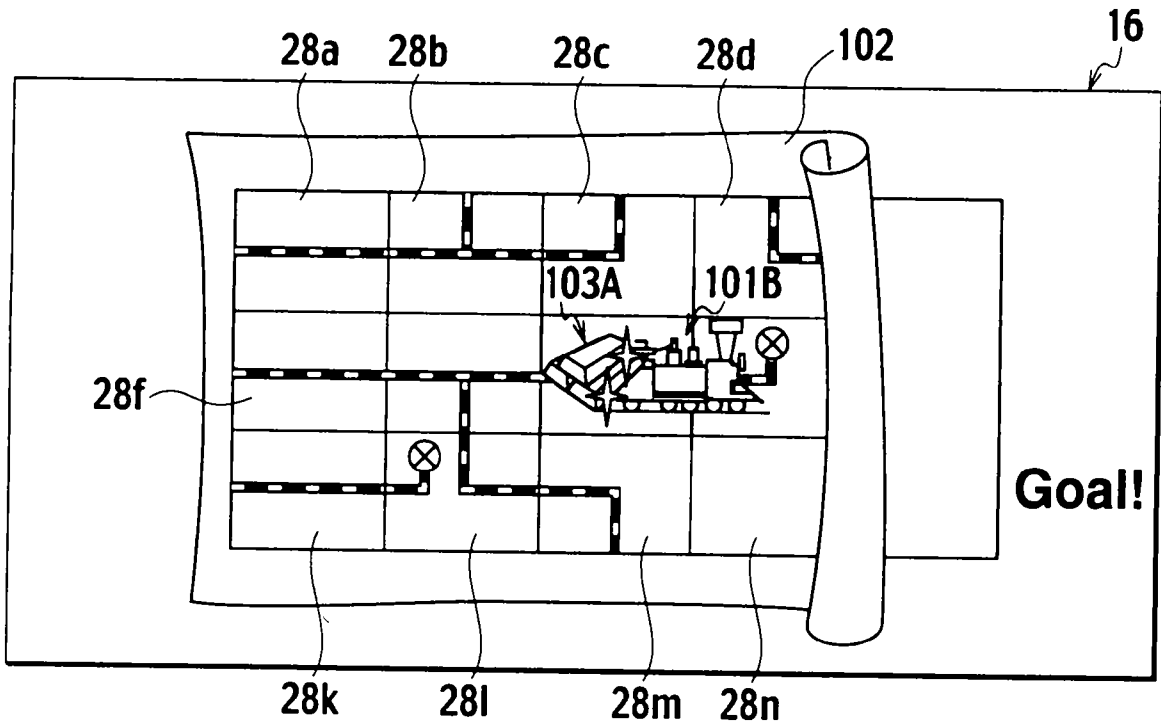


FIG. 14





**FIG. 15**



**FIG. 16**

